Contamination with Polycyclic Aromatic Hydrocarbons (PAHs) of Spawned and Ovarian Eggs Of Pacific Herring *(Clupea pallasi)* in Puget Sound, WA

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Abstract

This study was conducted to evaluate exposure of spawned eggs of Pacific herring to common nearshore toxic contaminants, and to provide baseline exposure estimates from which exposures can be compared after oil spills. We measured PAHs in ripe ovaries taken from pre-spawning wild Pacific herring, and from one- to 10-day-old wild spawned herring eggs removed from spawning substrates. Spawned egg samples represented six of the major Puget Sound spawning stocks; two from Central Puget Sound (Port Orchard/Port Madison and Quartermaster Harbor), two from Northern Puget Sound, but near oil refineries or other heavy industry (Cherry Point and Fidalgo Bay), and two from Hood Canal (Port Gamble and Quilcene/Dabob). We compared concentrations and patterns of 35 PAHs in ovaries with spawned eggs to make inferences about whether PAHs in spawned eggs were maternally or environmentally derived, and to describe geographic trends in exposure of eggs to PAHs. Our results suggest that exposure of spawned eggs to PAHs was environmental (i.e. waterborne), and that site-specific patterns (sources) exist. We observed highest concentrations in eggs from Hidden Cove, a primary spawning ground for the Port Orchard/Port Madison stock, at levels exceeding an effects threshold. A cooperative study between the WDFW's Puget Sound Ambient Monitoring Program and Oil Spill Response Team, and the Environmental Conservation Division of the National Marine Fisheries Service is planned to investigate the relationship between the PAH exposures and mortality of herring eggs we have observed in Hidden Cove.